REFLECTIVE TYPE OPTICAL BEAM SMOKE DETECTOR

RK 90 R

USER GUIDE

TECHNICAL INSTRUCTIONS FOR INSTALLATION, SETUP AND MAINTENANCE

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STANDARD STARTING CONDITION

- SW1 - position 1 (minimum threshold level)
- SW2 - position 1 (minimum threshold level)
- SW3 - position 4 (maximum Trasmitter power)
- JP1 - position 2-3 (ottic allignment insert)
- JP2-JP3 - position 2-3 (alarm and turbulence relays NC)
- JP4 - position 1-2 (fault relay) NC)
- JP5 - position 1-2 (memory OFF)
- JP7 - not insert (alarm relais NC)
- P1 - regutator trimmer at half scale

QUICK INSTALLATION

The procedure below is intended for trained personell with previous experience in installing EDS Beam Smoke Detectors RK90R. If you don't have the needed experience please refer to the standard installation procedure of this manual.

1 - Fix the RK90R detector

2 - Connect the cables

3 - Set the JP2-JP3-JP4-JP5-JP7 jumpers (see pag.10)

4 - Make the optical allignment with the lamp

5 - Set the JP7 jumper in accord with the detector/riflector distance (tab.pag.9)

6 - Set JP1 in ON position (Allignment) (pag.10)

7 - Optimize the device signal using:

- **the P1 trimmer**
- **the adjustment screws V1-V2-V3 on the optical block**
- **a multimeter (or the STS01 instrument)**
- **Blue/Red Led signal level indication (fig.8 board)**

8 - with the P1 trimmer regulate the signal between 4,7V and 5V.

9 - Verify the operational obcuring the reflector

10 - select the desired sensibility of the Obscuration circuit with the SW2 selector (40-50-60-70%)

11 - select the desired sensibility of the Turbulence (Heat) circuit with the SW1 selector (if used)

12 - set JP1 in the OFF position to activate the device

11 - close the cover within 5 minutes

12 - wait at least 5 minutes for the device to become operational

13 - perform operational tests

GENERAL

The RK90R detector is a newly-conceived microprocessor linear smoke detector, that bases its working concept on the interaction between the smoke present in a in a room and an infrared beam emitted by a transmitter and reflected by an optical reflector (fig.1).

The normal installation consists in mounting the detector on a wall of the room to be protected and in fixing the FX reflector (FX01, FX02, FX03 depending on the distance) on the opposite wall.

For a correct installation, we recommend to read and follow our instructions carefully.

The excellent working results of the device will widely compensate the time spent reading these instructions.

1 - QUALIFIED PERSONNEL

All the operations of installation, setup, startup, maintenance and verifications of operation of the RK90R detector must only be performed by qualified personnell.

These people are qualified for their experience, specialization courses, knowledge of the current standards and of the technical specifications, features and usage method of the product.

These people therefore are able to avoid errors or damages and assure an optimal functioning of the product.

2 - RELEVANT STANDARDS

2.1 - For the installation in European Community countries you must follow the EC standard EN54-14 (Fire detection and fire alarm systems).

In extraeuropean countries you must respect the relevant international and national standards.

3 - INSTALLATION

3.1 - For the installation of the RK90R detector, we advise to use besides the normal tools (drill, expansion plugs , etc) also the following elements:

- 1 - 7mm “C” Key
- 1 - alignment lamp (we recommend to use LAL02 lamp) or an electric torch with powerful and narrow beam)
- 1 - tester (we recommend an analogical hand Tester or ours analogical STS01 meter (optional) to be plugged on the special connector positioned on detector’s circuit).

3.2 - Unscrew the two fixing screws (fig. 2) and remove the cover

3.3 - Install the device at a distance from the ceiling within the 10% of the height of the room to protect.
This distance can be varied by the system designer if particular environmental conditions exist.
Wall fixing must be done with care using the holes provided inside the container.
If the wall is a solid masonry one, expansion plugs are enough.

It’s extremely important that the fixing wall or surface is rigid and not subject to deformations.

3.4 - Get the cables inside through the holes obtained breaking the suitable zones marked on the sides of the detector’s base.

It is important to use a suitable chock with a connecting pipe to avoid that the dust penetrates inside the device, possibly causing failure to its correct functioning.

3.5 - Install the reflector FX.. on the opposite wall and at the same height of the detector.
It is not necessary that the FX is perfectly in front of and perpendicular to the detector (angle mistake up to 5 degrees is possible in all directions).
We recommends, for the cables economy, to install the detectorr in the nearest position to the alarm control unit.

4 - CABLE CONNECTIONS

4.1 - The low detector's power consumption (14 mA with normally open alarm relay contact (NO) and 28 mA with normally closed alarm relay contact (NC)), allows to use small size sections cables.

We suggest to use a shielded cable with 10 conductors + shield (2x0,75 mmq for power conductors + 8x0,22 mmq for the signal conductors) for a distance up to 1 Km.
In such way it is possible to get a remote connection of the following signals:

- alarm relay contact (terminals C1-N1)
- turbulence (heat) alarm relay contact (terminals C2-N2)
- fault relay contact (terminals C3-N3)
- analog 0-5V output (for signal level measure from distance)

The shield of the cable must be connected as in fig.11.

5 - ELECTRICAL CONNECTIONS AND INITIAL SETUP

5.1 - Connect the device cables as shows on the labels facing the terminal board. The given symbols indicate what follows:

- **(V+) - (V -)** - supply's terminals 11 - 30 Vdc.

- **(C1) - (N1)** - normally closed alarm relay contact. The connection is valid when the detector is not in an alarm state and the JP2 is in 2 - 3 position. If JP2 is positioned on 1-2 the contact results normally open. C1-N1 terminals are voltage free

- **(C2) - (N2)** - turbulence alarm normally closed contact relay. The connection is valid when the detector is not in an alarm state and the JP3 is in 2 - 3 position. If JP3 is positioned among 1-2 the contact it results normally open. C2-N2 terminals are voltage free

- **(C3) - (N3)** - normally closed fault relay contact. Connection is valid when the detector is not in fault state and JP4 jumper is in 1 - 2 position. If JP4 is in 2-3 position the contact is normally open. C3-N3 terminals are voltage free. Fault relay is normally powered (intrinsic safety)

- **(SIG)** - 0-5V analog output terminal. To use only during allignment.

5.2 - JUMPER SETTINGS

JP1- to enter/exit the optical alignment procedure. To activate the procedure of optical alignment, JP1 must be in 2-3 (ON) position.
To deactivate the procedure of optical alignment JP1 must be in 1-2 (OFF) position.

• JP1 position 2-3 (ON).....alignment procedure on
• JP1 posizione1-2 (OFF)... procedure alignment off

JP2 - JP3 - JP4 to set the output contacts respectively of Alarm relay, Turbulence relay and Fault relay to normally closed NC or normally open NO (cap. 5.1). The RK90R detector is normally factory preset with normally closed NC contacts. For the alarm relay the indication of JP2 is valid if JP7 is in OFF position.

JP5 - activate the alarm memory function or to deactivate that function (detector automatically resets alarm output)

- position 1-2 alarm memory off. When the detector gets out of alarm condition it automatically resets alarm output
- position 2-3 alarm memory on. In case of alarm, the detector's alarm output persists until power supply is switched off for at least 5 seconds

JP6 - microprocessor reset (SW reset)

JP7 - jumper for set the power of the transmitter according to the distance between detector and his reflector.
The maximum distance admitted among RK90R and reflector it depends from the type of select reflector: 25m with FX01 - 40m with FX02 - 50m with FX03 - etc.

• disconnected (OFF) JP7 maximum power for max. distance (50m)
• inserted (ON) JP7 power reduced for short distance (25m)

JP8 - selection of alarm relay operational mode : normally powered or not powered

- JP8 OFF - relay of alarm normally not powered (in case of alarm the relay gets powered). In this case the indication is according to figure 10 (diagrams of the terminal block and the classical scheme of connection to a control system to terminated lines)

- JP8 ON - relay of alarm normally powered (in case of alarm the relay gets not powered).
  In this case the indication of 10 figure is inverted

6 - OPERATION

6.1 - the RK90R detector is equipped with 2 circuits of detection of the smoke produced by a fire:

• **Obscuration** - circuit sensitive to obscuration.

This circuit bases its operation on the attenuation of the infrared beam intensity, along the optical path between the transmitter and the receiver, caused by smoke presence.

• **Turbulence** - circuit sensitive to turbulence.

During the beginning phase of a fire, generally there are some clouds of smoke and warm air that rise up to the ceiling.
When these clouds and warm air intercept the infrared beam produced by the detector, they cause a perturbation of it, because they generate changes of optical and physics characteristics in the transmission mean of the infrared beam.
This variations are obviously time related.

An suitable circuit has been designed to detect these variations and, when these reach the programmed amplitude and the duration in time, an alarm signals is generated.

The sensitivity is independently adjustable to fully satisfy the specific application needs.
The advantage offered by this circuit is a great speed of fire detection, because it is detected in dynamic way in its initial phase.

7 - OPTICAL ALIGNMENT

7.1 - proceed with the optical alignment of the detector and FX reflector. To facilitate the operation we suggest to do it in low ambient light conditions and to proceed in the following way:

- place in front of the reflector FX.. (fig.3) an optical alignment lamp able to project a narrow and sufficiently intense light beam. (we recommend the EDS alignment lamp LAL02)

- direct the light beam of the lamp to the lenses of the detector

- look at the screen that is behind the lens, inside the detector.
  On it you will see a bright point that represents the image of the lamp

- move the optical block using his special screws V1-V2-V3 with a key, so that the bright point falls in the center where a small hole is present through which the photodiode is visible (fig.4).
  It's important that the bright point falls on the photoemitting zone of the photodiode.
  This zone is represented by the small dark dot in the center of the photodiode. In such way the detector will be perfectly alligned with the FX.

After doing the optical alignment of the detector it is necessary to do the electric signal setting operations, proceding with the following instructions.

8 - SETUP OF THE OBSCURATION CIRCUIT

Setting operations of the electric signal must be perform according to the following sequence:

8.1 - do not power up the detector

8.2 - set up JP7 according to the distance between detector and FX with reference to the table fig.7 (FX01-FX02-FX03 ecc.)

8.3 - move the jumper of Initial Set JP1 (fig.9) in ON position 2- 3 (Alignment) to activate the phase of initial setting

8.4 - power up the detector

8.5 - the blue led and the red one will start to work in the way described ahead in the cap. 8.12. Before passing here to this chapter read what follow

8.6 - the P1 trimmer (regulation of the signal level) is factory preset to the 50-60% and it corresponds to a signal of 5V at the maximum distance

8.7 - to get the best results in the following operations, we recommend the use a measuring instrument (Multimeter), preferably an analog hand type, for better control of the variations of the signal during the setup. Good results are also obtained using analog meter STS01 (optional), designed for this application, that must be inserted on the special connector CN4, set on the printed circuit of the detector (v. fig. 11). If you don't have a Multimeter or the STS01, you can perform the setup operations anyway evaluating the signal level with the frontal Leds indications as described in chap.8.12

8.8 - if available, connect a 5V fullscale multimeter between the SIG terminal and the negative power supply one and read the analog output signal. Instead of the multimeter it is possible to use the STS01 meter (optional - fig. 11). If the output signal is very low, it means that the operations of optical alignment, described in chapter 5, have not been performed in the right way and therefore must be repeated

8.9 - the transmitter of the detector emits a conic beam which form and dimension, in relation with the distance between detector and FX, are explained in figures 5 -6. It's important that the FX is in the center of the detector's conic beam because, under these conditions, even if some small movements of the wall, on which the transmitter is mounted on, happen (caused by deformations), the reflector remains always within the beam and therefore active.
To obtain this, the operations of fine centering with output signal measuring, explained below, must be performed with care.

8.10 - adjust the signal around 3V acting on the trimmer P1 (fig.9)

8.11 - search for the maximum output signal optimizing the optical alignment of the detector acting slowly and in sequence on the 3 screws of regulation V1-V2-V3 present on the optical block. This procedure takes some time but, if performed well, it assures a perfect operation of the detector for many years. We suggest to use the following procedure:

• on the detector slowly turn the screw V1 clockwise and then look at the value of the signal visualized on a multimeter. If the signal increased (for example from 3V it rised to 3,5V) then again turn the screw V1 of the detector clockwise and then look at the value of the signal

• continue with this procedure as long as the signal increases. When it has the tendency to decrease instead, stop the operation on the screws V1 of the detector returning to the previous position

• if during the operation the signal overcomes 4,5V, to avoid the saturation, act on the trimmer P1 to bring the signal back to 3 V, allowing the best evaluation of the variations of the signal

• after finding out the maximum og the signal acting on the screw V1, perform the same operations on the screws V2 and V3.

In such way the best possible position of optical allignment is reached. This procedure is important because it will assure a perfect operation of the detector for long time

8.12 - if you don't have a multimeter it is possible, to get good results in the optical alignment of the detector as well, looking at the detector blue and red leds indications. Operation is the following:

- 1 flash of the blue Led: 1 Volt
- 1 flash of the red Led: 0.5 Volts
- if the signal is smaller of 0.5V the blue led and red one are off
- if the signal in the range 0.5-1 V the red led performs 1 flash, remains off for 2 seconds and then it repeats the sequence
- if signal is among 1-1.5 V the blue led flashes once, remains off for 2 seconds and then it repeats the sequence
- if signal is among 1.5-2V the blue led flashes once and the red led flashes once. They remain off for 2 seconds and then the sequence is repeated
- if signal is among 2-2.5 V the blue led flashes 2 times, remains off for 2 seconds and then it repeats the sequence
- if signal is among 2.5-3V the blue led flashes 2 times and the red led flashes once. They remain off for 2 seconds and then the sequence is repeated
- same type of indication up to 4 V
- if the signal overcomes 4 V, the blue Led flashes faster and faster as the frequency signal increases up to 4.7V
- when the signal overcomes the 4.7V and in the range 4.7V - 4.9V, the blue led is continously ON. This is the position of optimal setup
- if the signal gets over 4.9V the two blue and red leds are permanently on. This is the saturation indication.

The table of fig.8 recaps the leds operation.

8.13 - After having executed the operations of fine optic alignment using the multimeter or the indications of the led, you must regulate the signal slowly acting on the trimmer P1, among 4.7-4.9V. When the signal it is included among this value, the blue led is stably ON.
This it is the position of optimal setting. If the signal overcomes the 4.9V, the detector goes in the saturation and the Led blue and red are stably ON.
Therefore acting on P1, it is necessary to set the signal between 4.7-4.9V so that the red led switch OFF and is only ON the blue Led (to avoid the saturation).

Attention! - this regulation is not critical. The procedure indicated above is the optimal one, but it is enough if the blue Led is flashing or constantly ON to have a good setting. However it is necessary to avoid the saturation (red Led ON). The microprocessor automatically compensates the inaccuracies of the setup.

8.14 - It needs besides to watch out that, since the detector bases its operation on the reflection of the projected beam, this reflection is effected by its reflector FX and not from other elements.
To be certain that the signal is produced by the reflection of its reflector FX and not from other elements, it is useful to do a simple verification.
It is necessary to obscure the reflector with a non reflecting screen (opaque). In that case the signal on SIG terminal must be under 0,5V. (check indication in the following pages)

8.15 - select the alarm threshold level of the circuit sensible to obscuration acting on the selector SW2 keeping in mind the following:

- position 1 - low sensitivity - obscuration alarm threshold set to 70%
- position 2 - low to medium sensitivity - obscuration alarm threshold set to 60%
- position 3 - medium to high sensitivity - obscuration alarm threshold set to 50%
- position 4 - high sensitivity - obscuration alarm threshold set to 40%

8.16 - sensitivity must be regulated according to the environmental situation.
The setting must normally be a medium sensitivity level, but in case of dusty and perturbed environments it will be useful to set a lower sensitivity level.

9 - SETTING OF TURBULENCE CIRCUIT

9.1 - The RK90R detector is equipped with a special additional circuit for the detection of air Turbulence (heat).
This circuit is independent from the classic obscuration one and in particular situations it can be used to increase the performance of the detector. If these particular situations are not present the Turbulence circuit can be left unused.

9.2 - This circuit is particularly useful when, for environmental reasons, the optical beam smoke detector must be installed at distances from the ceiling higher than the nominal.
When the fire begins, it produces smoke clouds and hot air bubbles that go up.
When these bubbles intercept the infrared beam they perturbate it because they produce a change of the optical-physical characteristics of infrared beam.
These changes are obviuslycorrelated in time.
This circuit is been projected to detect these changes and, when these changes reach the programmed width and time lenght, an alarm signal is generated.
The advantage of this circuit is the quicker fire detection, because the fire is detected in its beginning phase.
A typical example is the complete protection of the dome of a church with important pictures on its surface.
The optical beam smoke detectors must be installed at the baseline of the dome and therefore much lower than the ceiling.
In this case using the turbulence (heat) detection circuit is very useful to improve the detection.

9.3 - selection of the sensitivity level of the circuit sensitive to Turbulence(heat).
The operation is performed acting on selector SW1 of the detector that has 4 positions (fig.9).

- sensitivity increases from 1 to 4
- position 1 : minimum sensitivity
- position 4 : maximum sensitivity

The regulation must be performed with caution, because with an higher sensitivity a quicker response time is obtained, but also the probability of false alarm is increased.
So the sensitivity selection must be done according to the environmental conditions.
If these conditions are good, an high sensitivity regulation is possible.
If in the environment, because of the normal working conditions, dust's clouds, vapor or smoke are systematically produced, it will be necessary to adjust the sensitivity to a lower level, so that these factors doesn't generate false alarms.

10 - DETECTOR'S ACTIVATION

10.1 - put the jumper of Initial Set JP1 in position 1-2 (OFF)

10.2 - the blue alignment led flashes in particular way (2 flash slow - 1 break - 2 flash fast and then it repeats)

10.3 - install the cover. The operation of closing must have effected within 5 minutes. The level of the signal will suffer a diminution because of the absorption caused by the cover

10.4 - the microcontrolled electronics wait 5 minutes for the installation of the cover and then start a quick procedure (1-2 minutes time) to get the signal of the RK90R back to 4.7-5V

10.5 - When this adjustment procedure is finished, the detector becomes operational. The blue aligment led stops flashing in the way described above (detail chap.10.2) and it begins to flash as described in 10.6.

10.6 - The blue led will emit a short flash every 10 seconds, that indicates the normal operation of the detector. In case of alarm the frontal red led gets on and remains on until the alarm state disappears or, if the memory function is set, until the power supply is switched off for at least 5 seconds (see chap.14).

11 - AUTOCOMPENSATION

11.1 - The inside electronics of the detector is equipped with a special function of autocompensation of the signal. If the detector is installed inside a particularly dusty place, the dust deposited on the front cover causes a drop of the signal. This problem is automatically eliminated by the circuit of autocompensation.

12 - OPERATIONAL TEST

12.1 - verification of the circuit sensitive to the obscuration.

The verification is carry out simply by darkening **the reflector** with an opaque screen .
After 10 seconds, detector's alarm relay must activate / deactivate (cap.5.2 - jumper JP8) and the frontal red led of alarm must be switched ON.
After that, remove the screen and the alarm relay switches and the blue led restarts to flash every 10 seconds.
If the memory function is activated, (chap.14) for relay's switching it is necessary to remove the power supply of the detector for at least 5 seconds.

Attention!

• this test must be effected darkening the reflector
• the screen must not be set in front of the detector

12.2 - verification of the circuit sensitive to the turbulence (heat).

Verify the circuit sensitive to turbulence putting a opaque screen **in front of the reflector** several times with the following sequence (dark / light) and selecting sensitivity with the selector SW1:

- position 1....2 second dark - 2 second light for 10-12 times
- position 3....2 second dark - 2 second light for 8-10 times
- position 2....2 second dark - 2 second light for 6-8 times
- position 4....2 second dark - 2 second light for 4-6 times

After the correct sequence, the Turbulence relay must be activated.

13 - FAULT OUTPUT

13.1 - The contact of fault/malfunction relay is available on the terminal block of the detector . This relay is normally activated and will become deactivated if the following conditions are verified:

- the signal drops below the 90% setup value (optical beam completely interrupted by an obstacle)
- the circuit of autocompensation has reached the limit (when this happens to proceed it is necessary to the maintenance of the detector)
- malfunction (it means breakdown of some component)

Attention: As stated by the relevant standards, the fault output can be used for remote signaling, but must not be used for inhibiting the alarm signal.

14 - ALARM MEMORY

14.1 - the RK90R is equiped with an alarm memory that can be switched ON/OFF with the jumper JP5 (fig.9):

- jumper JP5 in position 1-2 - memory not activated (OFF)
- jumper JP5 in position 2-3 - activated (ON)

When the memory is activated, if the detector goes in alarm, the Alarm relay and the frontal red led remain activated until the alarm condition disappears and the power supply is not switched off for more than 5 seconds. When the memory is not activated, if the detector goes to alarm, the alarm relay and the frontal led are deactivated as soon as the alarm stops.

14.2 - Memory of configuration and settings data.
In case of black out the memory inside preserves the data. When the power supply is back, the detector, after an initialization of about 2 minutes, returns to normal operation.

15 - FRONTAL LEDS OPERATION

15.1 - The frontal leds of the detector, during the normal operation, give the following indications (v. fig.9):

- normal operation: the blue Led flashes every 10 seconds
- alarm: the red Led is constantly ON
- limit of compensation, interrupted beam, malfunction: the blue led flashes

16 - MAINTENANCE

16.1 - the instrument asks for a simple and periodic maintenance. It can be programmed or made automatic on special signaling of the detector.

During the normal operation and after a certain time from the installation, if the maintenance is not performed, the detector, because of the dirt deposited on the frontal surface of the cover, produces a Fault signal because of the drop of the signal over the limit of compensation.
Then it will be the moment to proceed to cleaning of the surface so that to restablish the initial optical conditions.

16.2 - The operations to be effected are the followings:

- the detector must be not powered
- clean the cover surface of the detector. You must use a wet cloth with water and some trace of soap. Chemical products must not be used what: alcohol, ammonia and similar. The cleaning of the surface is fundamental for the good detector operation
- verify the inside terminal board tightening the terminals in the case they are loose
- verify the optical alignment in the case of some deformations of the structure on which the detector is installed. In such case repeat therefore the operations to the cap.8
- power up the device

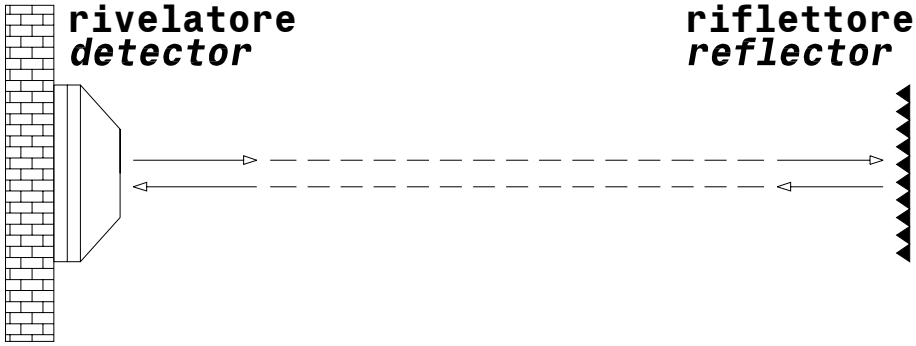
17 - SENSITIVITY SELECTION

17.1- After the installation and after some operation time, if you want to modify the sensitivity of the detector, read what follows:

- remove the cover (it is not necessary to power down the detector)
- modify the sensitivity acting on the SW2 selector
- close the cover

18 -TECHNICAL DATA

- Model: RK90R
- Type: Reflective type Optical Beam Smoke Detector
- Manufacturer: EDS srl - V. Cà Nova Zampieri 6 - 37057 S.G. Lupatoto - Verona - ITALY
- Power Supply Range: 11- 30 Vdc
- Optical Path Lenght:
  3 - 12 m with FX-07 reflector
  10 - 25 m with FX-01 reflector
  20 - 40 m with FX-02 reflector
  25 - 50 m with FX-03 reflector
- Max. covered area: 750 mq
- Protection against the inversion of polarity
- Digitally codified infrared beam
- Power Consumption:
  18,6 mA in normal operation
  34 mA with the alarm relay activated
  34 mA with the turbulence relay activated
  50 mA with both alarm and fault relay activated
- Maximum angular missallignment of the detector: +/- 0,2°
- Maximum angular missallignment of the reflector: +/- 0,2°
- Selection of the obscuration alarm threshold level with a 4 positions switch:
  position 1 - 70%
  position 2 - 60%
  position 3 - 50%
  position 4 - 40%
- Selection of the turbulence alarm threshold level with a 4 positions switch
- Alarm Relay activation delay: 10 s
- Fault Relay activation delay: 5 s
- Detector's recovery time with alarm memory deactivated: about 5 s
- Detector's recovery time with alarm memory activated: about 5 s (power supply off)
- Working temperature: -10 + 55°C
- Red LED indication: alarm status
- Blue LED indication: compensation limit, interrupted beam, fault
- Alarm Relay: 1A/24 V dc
- Turbulence Relay: 1A/24 V dc
- Fault/Maintenance Relay: 1A/24 V dc
- 0-5 V Analog Output for signal level measuring/visualization
- Dimensions: 162 x 62 x 62 mm.
- Housing: autoextinguishing policarbonate box
- Relevant Standard: EN 54-12
- Certifications: EN54-12/CPD (0786-CPD-20803), VDS2504-VDS2344 (G209131)
- Protection Index: IP 50 (IEC 529-144)
- Weight: 200 gr.


rivelatore
detector
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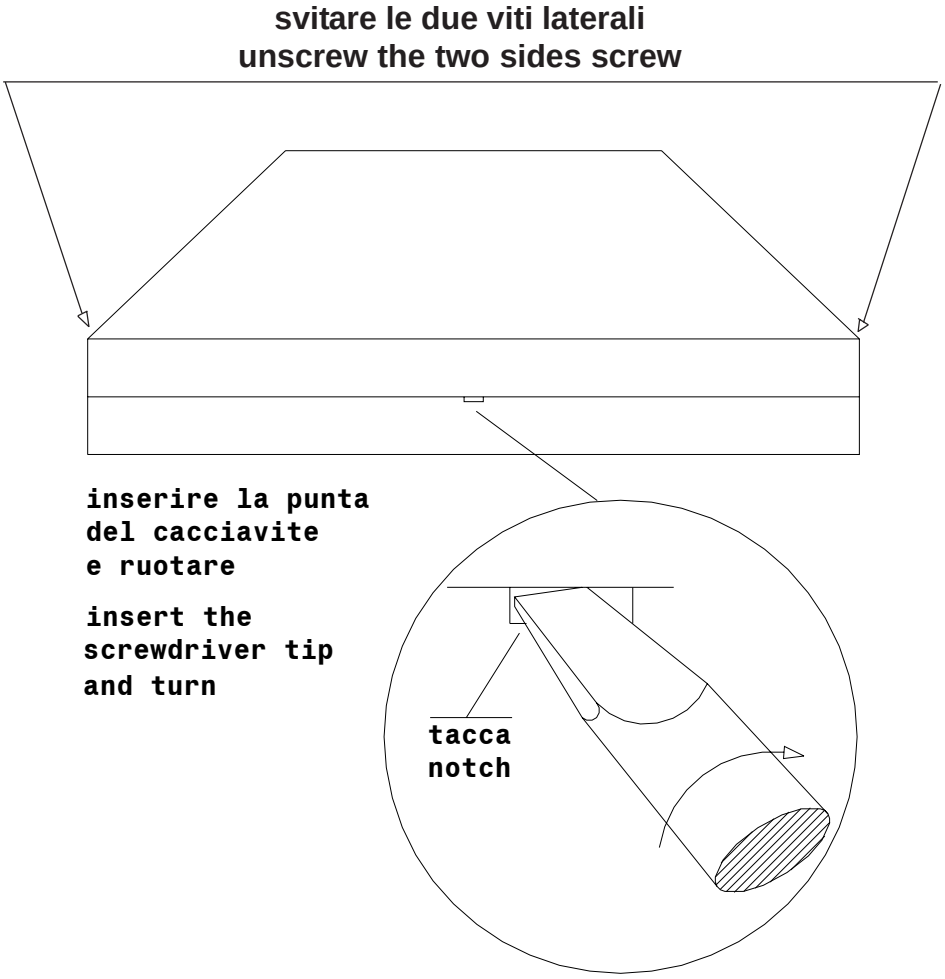
reflector

fig.1


svitare le due viti laterali
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inserire la punta
del cacciavite
e ruotare
insert the
screwdriver tip
and turn
tacca
notch

fig.2

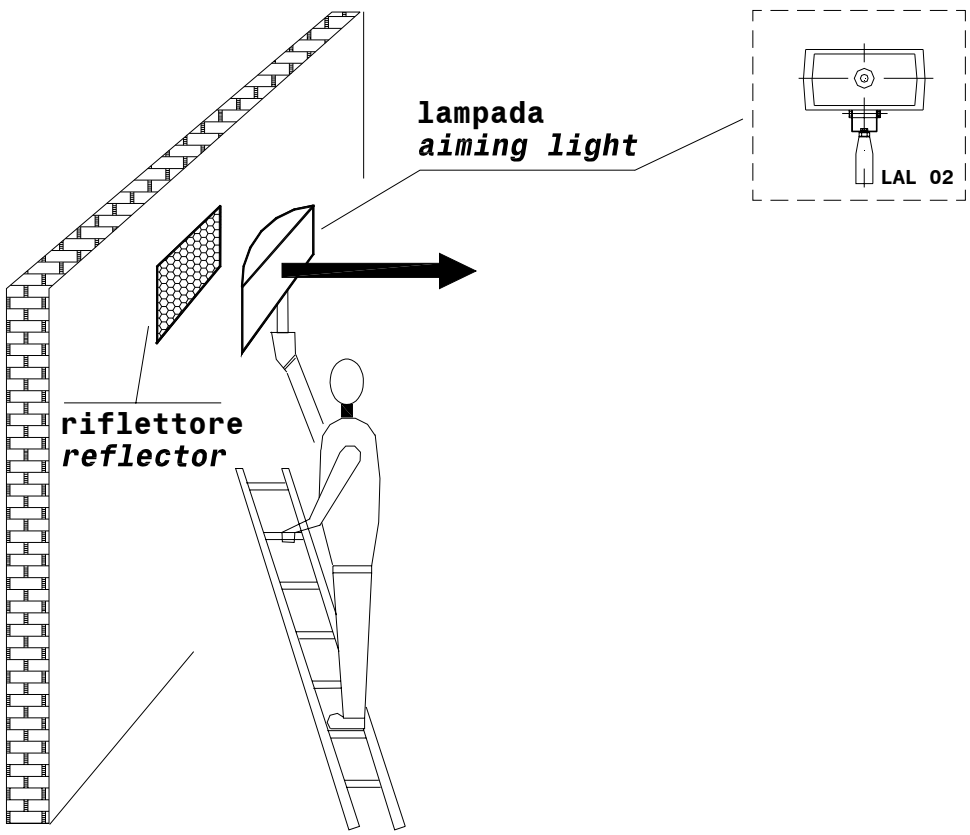

lampada
aiming light
LAL 02
riflettore
reflector

fig.3

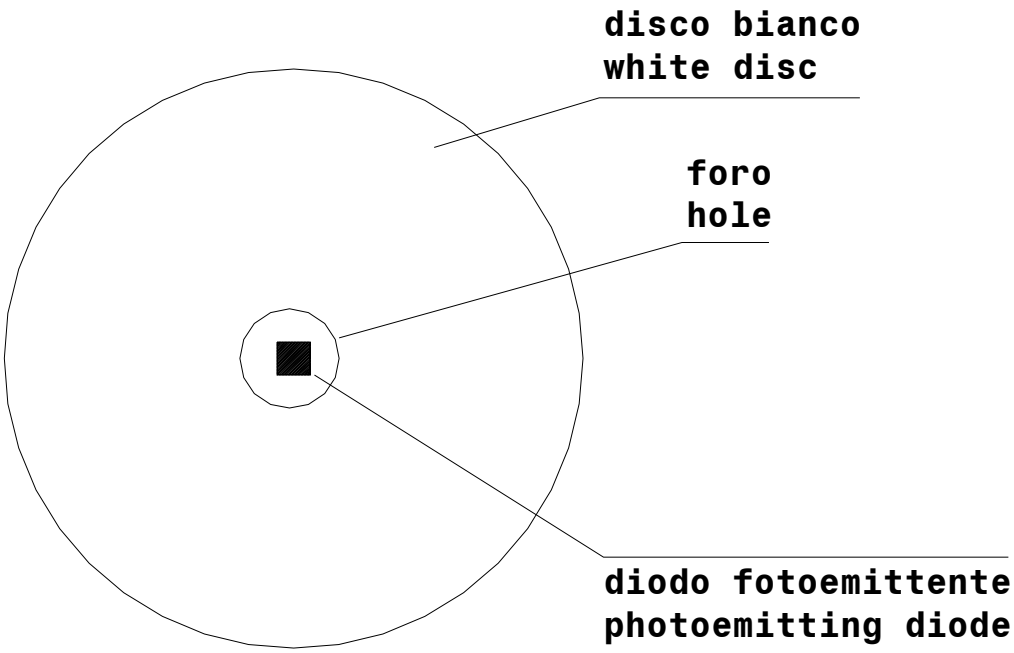

disco bianco
white disc
foro
hole
diodo fotoemittente
photoemitting diode

fig.4

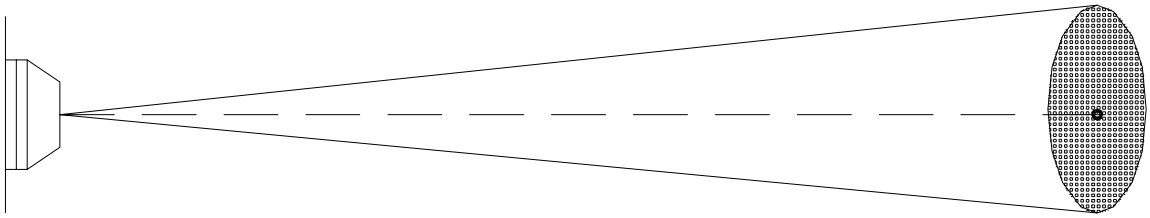


fig.5

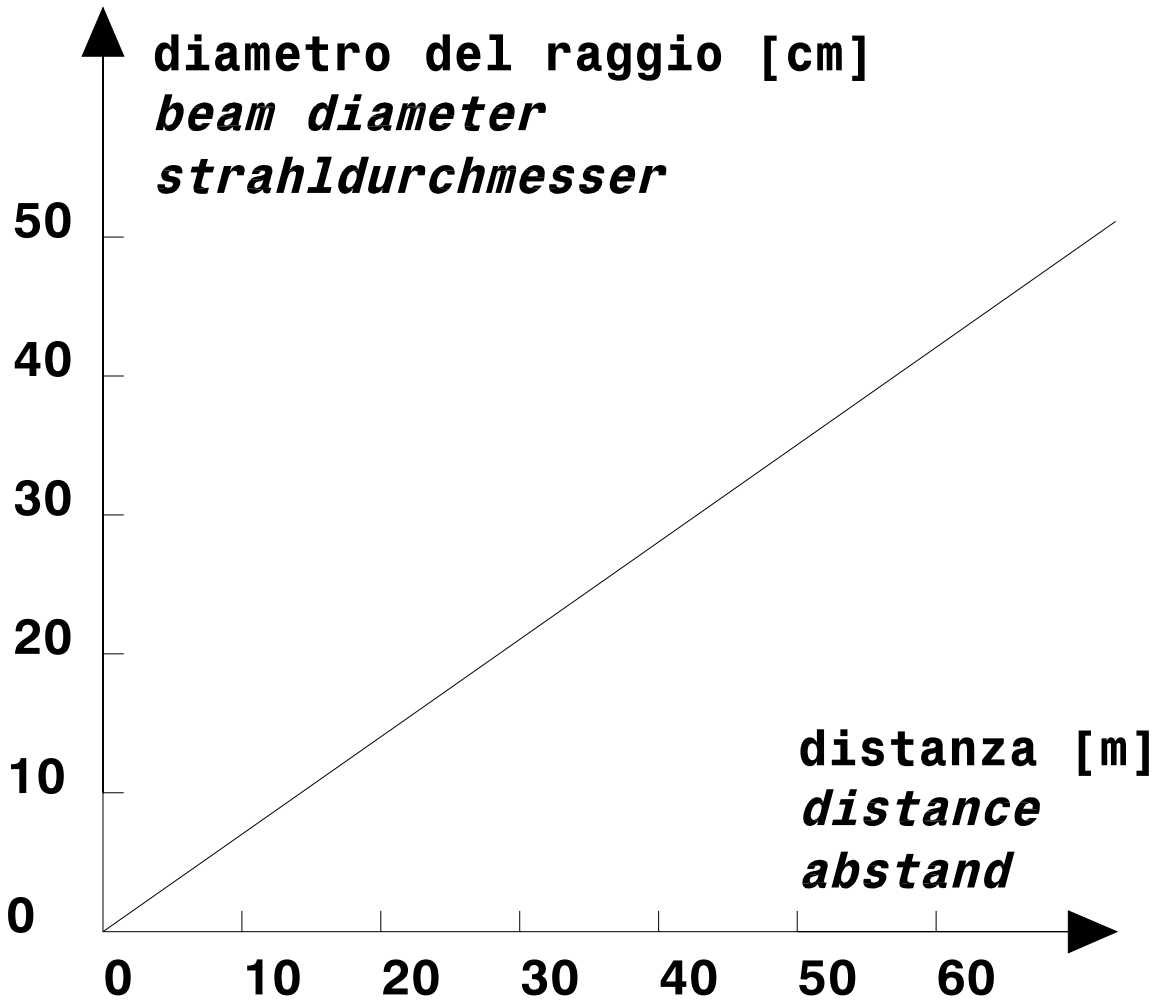

diametro del raggio [cm]
beam diameter
strahldurchmesser
50
40
30
20
10
0
distanza [m]
distance
abstand
0
10
20
30
40
50
60

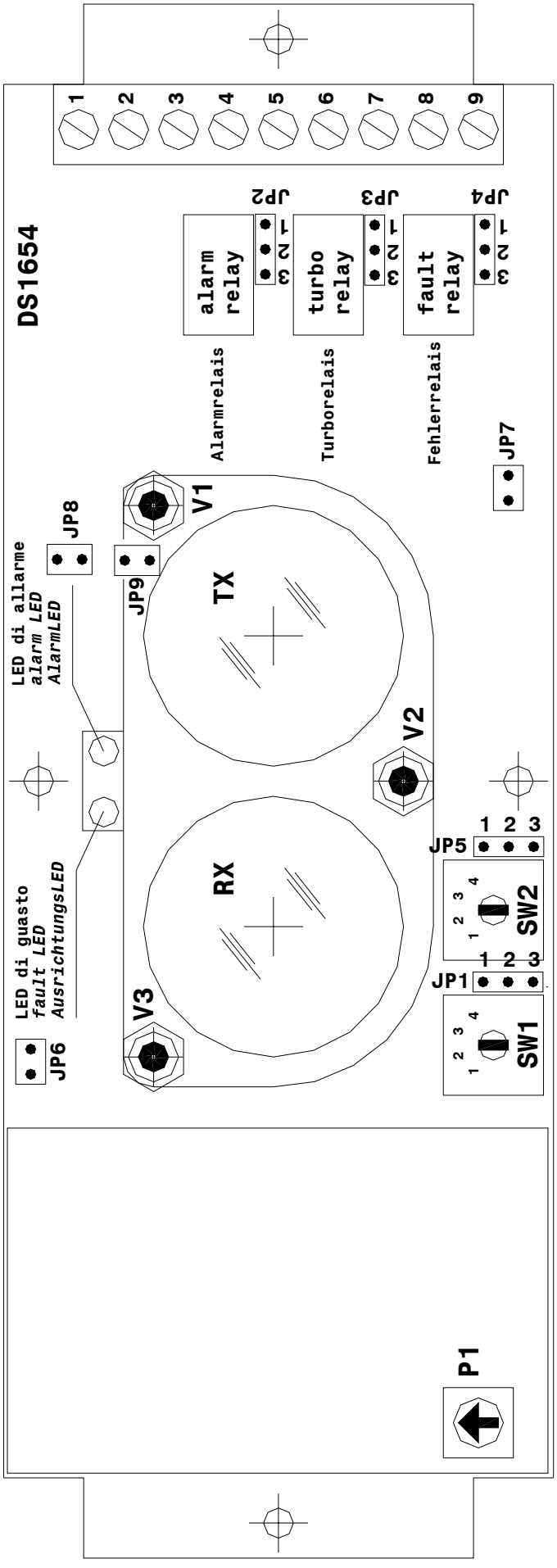
fig.6

DISTANCE SELECTION WITH JP7		
REFLECTOR	POSITION	DISTANCE [m]
FX07	ON	3-6
	OFF	6-15
FX01	ON	10-15
	OFF	15-25
FX02	ON	20-30
	OFF	30-40
FX03	ON	25-35
	OFF	35-50

fig.7

RELATION VOLT - FLASHING		
VOLT	**N° Flash Blue Led**	**N° Flash Red Led**
< 0,5	OFF	OFF
0,5-1	OFF	1
1-1,5	1	OFF
1,5-2	1	1
2-2,5	2	OFF
2,5-3	2	1
3-3,5	3	OFF
3,5-4	3	1
4-4,7	Variable -/+	OFF
4,7-4,95	Fix light	OFF
> 4,95 saturation	Fix light	Fix light

fig.8


1 2 3 4 5 6 7 8 9
DS1654
alarm relay
turbo relay
fault relay
JP2
JP3
JP4
1 2 3
Alarmrelais
Turborelais
Fehlerrelais
JP7
JP8
JP9
V1
V2
V3
TX
RX
LED di allarme
alarm LED
AlarmLED
LED di guasto
fault LED
AusrichtungsLED
JP6
JP5
JP1
SW1
SW2
P1

INTERNAL PARTS

P1 - Signal level regulation trimmer. P1 is factory preset to 50-60%, that corresponds to a 5V signal for the maximum distance.

SW1 - Sensitivity selector for the turbulence circuit. Sensitivity increases from position 1 to 4. On position 1 it's mimimum and in position 4 position it's maximum.

SW2 - Obscuration circuit selector.

- low sensitivity - position 1 - alarm level for 70% of obscuration
- ow/medium sensitivity- position 2 - alarm level for 60% of obscuration
- medium/high sensitivity- position 3 - alarm level for 50% of obscuration
- high sensitivity- position 4 - alarm level for 40% of obscuration

V1-V2-V3 - Optical block regulation screws

JP1 - activate/deactivate the alignment procedure. To activate the optical alignment procedure, the JP1 jumper must be on 2-3 (ON) position.
To deactivate the optical alignment procedure, JP1 jumper must be on 1-2 position (OFF)

- JP1 2-3 position (ON).....alignment procedure activated
- JP1 1-2 position (OFF) ....optical alignment deactivate

JP2 - JP3 - JP4 - output contact set jumpers, respectively for:
Alarm relay, Turbolence, Breakdown (NC) or (NO)

- 1-2 position - NO contact (output contact Normaly Open)
- 2-3 position - NC contact (output contact Normaly Closed)

The JP4 only must be in 1-2 position for the contact to be closed, because the Fault relay is factory preset to activated.
The RK90 is factory preset with all jumpers set to NC.

JP5 - Jumper to activate or deactivate the alarm memory function (deactivated=autoreset of the detector)

- 1-2 position memory not insert (OFF). When the memory state ends the detector reset (Auto reset)
- 2-3 position insert memory (ON). In case of alarm, the detector maintain the alarm state till the power supply is not swtiched OFF for at least 5 second .

JP6 - microprocessor Reset jumper

JP7 - Jumper to set the transmitter power according to the distance between detector and the reflector. The maximum distance between detector and reflector depends on the chosen reflector: 25m with FX01, 40m with FX02, 50m with FX03, etc

- JP7 disarmed (OFF) .....maximum power for distance between half and maximum power scale admitted
- JP7 armed (ON) .....reduced power for distance minor than half

JP8 - Set the working mode of the alarm relay

- JP8 disarmed (OFF) .....alarm relay deactivated
- JP8 armed (ON) .....alarm relay activated

JP9 - not used

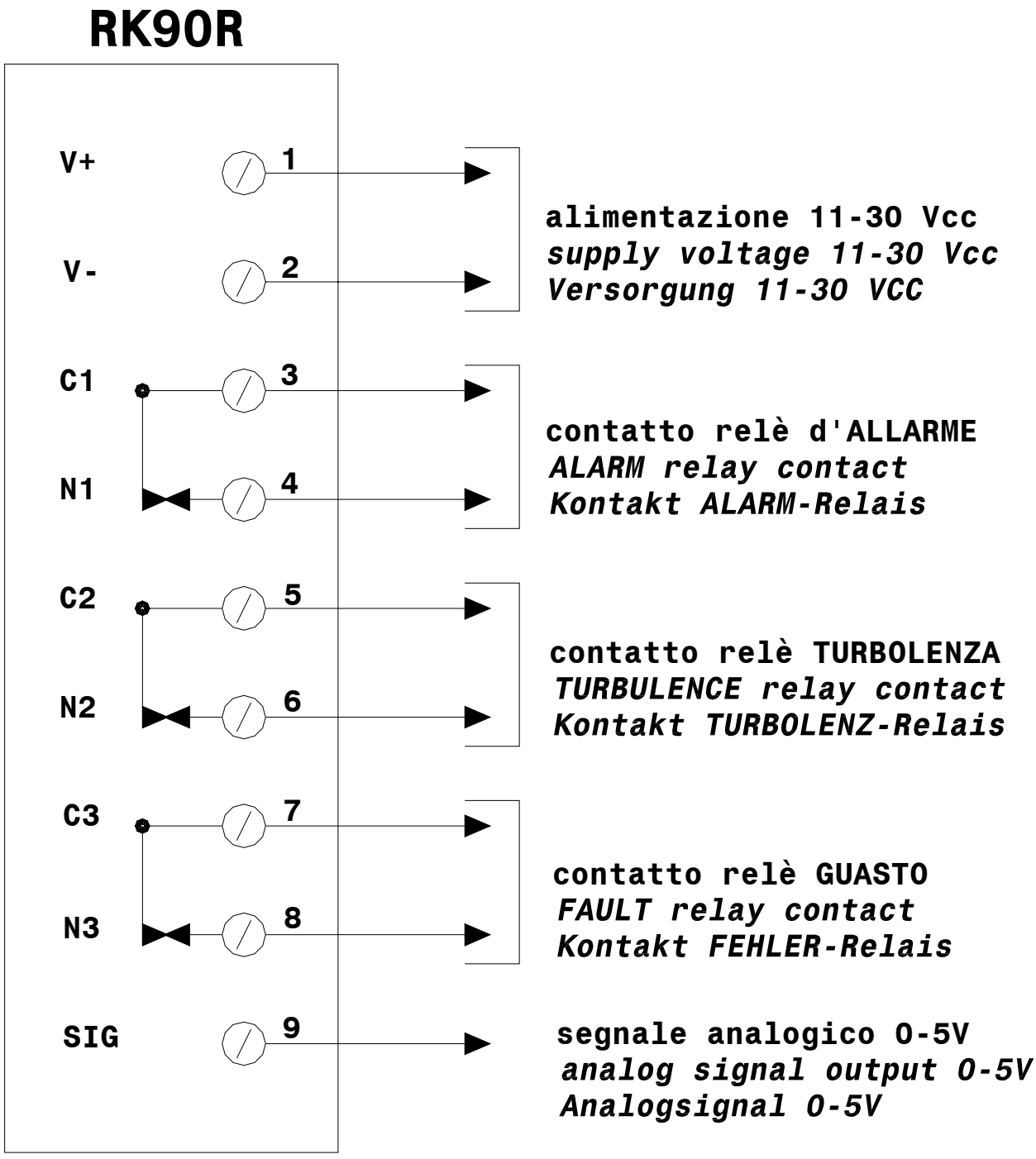
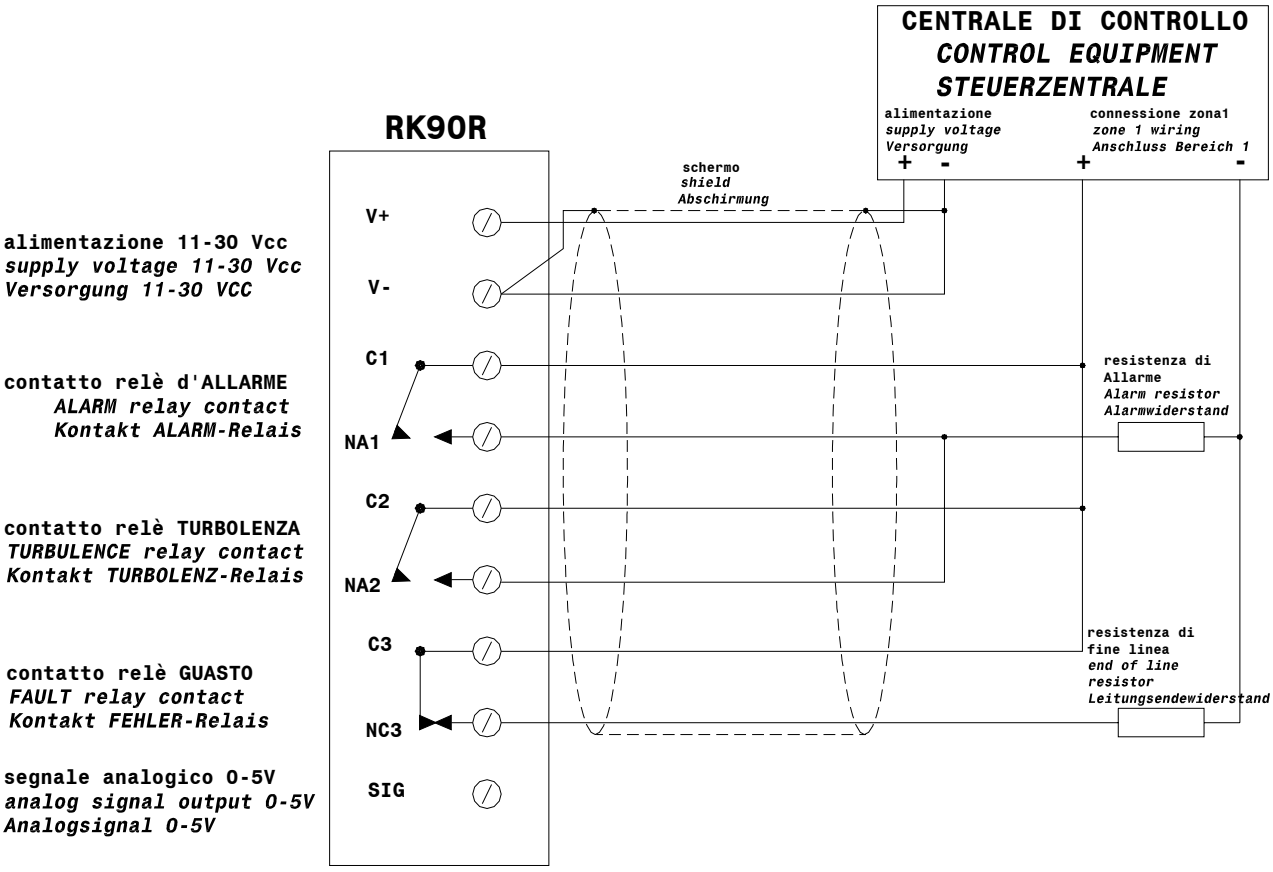

RK90R
V+
1
V-
2
alimentazione 11-30 Vcc
supply voltage 11-30 Vcc
Versorgung 11-30 VCC
C1
3
N1
4
contatto relè d'ALLARME
ALARM relay contact
Kontakt ALARM-Relais
C2
5
N2
6
contatto relè TURBOLENZA
TURBULENCE relay contact
Kontakt TURBOLENZ-Relais
C3
7
N3
8
contatto relè GUASTO
FAULT relay contact
Kontakt FEHLER-Relais
SIG
9
segnale analogico 0-5V
analog signal output 0-5V
Analogsignal 0-5V

fig.10

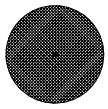
Example of RK90R connection with a zones Control Unit



Example of RK90R connection with a control unit. In this case, the detector occupy a control equipmet zone.
In this case the detector is a zone of the system.
The state of the indicated relays correspond to the normal operation condition of the detector.
The Alarm output is the one of the Alarm relay (circuit sensible to Obscuration circuit) or the one from the Turbulence relay (circuit sensible to Turbulence (heat) circuit).
The Turbulence relay, if not necessary, can be left unused.
The Fault output is the one from the NC contact of the Fault relay of RK90R.
The values of the resistances of Alarm and End of Line will be indicated by the control unit manufacturer.

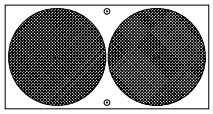
ACCESSORIES FOR RK90R

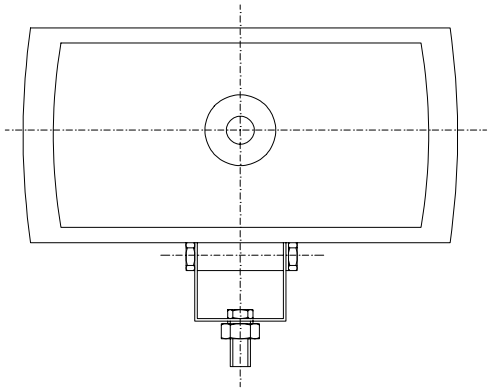
FX01- round reflector
Distance max.: 25m
Diameter 85 mm.



LAL02 -Optical alignment lamp. The RK series detectors on installation must optically aligned. This lamp is suitable to do an optimal alignment. The operation is done easily in a few minutes and it assures the full functionality of the detectors. The lamp has a L=15m cable for connection to a battery 12V for the power supply

FX02 - Two round reflectors with support by anodised aluminium.
Distance max.: 40m
Dimensions: 180x90 mm.

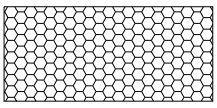




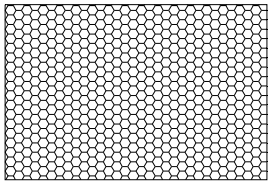
FX03 - Triangular reflector with support by anodised aluminium.
Distance max.: 50m
Dimensions: 175x205 mm.

Optimal design reflectors, high quality optic, suitable for museums, historical buldings ecc.

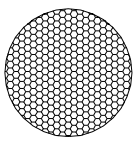
FX07 - mini reflector
Distance 3 - 15 m.
Dimension: 18 x 40 mm.



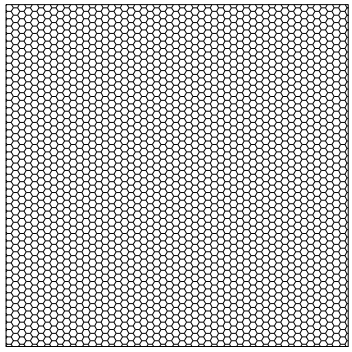
FX09 - reflector
Distance: 10 - 30 m.
Dimension: 40 x 60 mm.



FX08 - mini reflector
Distance: 3 - 12 m.
Round reflector diam. 24mm



FX10 - reflector
Distance: 10 - 30 m.
Dimension: 20 x 40 mm.



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1. OBJECT
EDS S.r.l. - Via Cà Nova Zampieri 6, 37057 S. G. Lupatoto - Verona, Italy (hereinafter “EDS”), guarantees its products to be free from defects in materials or workmanship within the terms and conditions of this Warranty. A product found by EDS to be defective will be repaired or replaced, at the option of EDS, within 24 month after receipt of the product by EDS or an authorized EDS Service Center. Please note that in addition to this policy you may have specific legal rights granted by your national or state laws regarding warranties of consumer products.

2. NOT COVERED
This warranty does not cover products which reached the end of their normal lifespan, does not cover damage resulting from accidents, alteration, neglect, misuse or abuse, lack of reasonable or proper maintenance, corrosion, improper assembly, repairs improperly performed or replacement parts improperly installed, use of replacement parts or accessories not conforming to EDS’s
specifications, use of component parts not manufactured or supplied by EDS, modifications not recommended or approved in writing by EDS, normal wear and deterioration occasioned by the use of the product. This warranty also does not cover cosmetic imperfections in the surface, finish, or appearance of the product which were apparent or discoverable at the time of purchase of the product or damage occurring during shipment or transport of the product. This warranty also does not cover tools and other consumables or any expenses related to the transportation of the product to or from EDS or an authorized EDS Service Center.

3. PURCHASER
This warranty is made only with the original purchaser of the product and does not extend to any third parties. The rights of the Purchaser under this warranty may not be assigned.

4. TERM
The term of this warranty shall commence on the date of retail purchase and shall continue for a period of 24 month.

5. ENTIRE AGREEMENT
This warranty supersedes any and all oral, express or written warranties, statements orundertakings that may previously have been made, and contains the entire Agreement of the parties with respect to the warranty of the product. Any and all warranties not contained in this Agreement are specifically excluded.

6. DAMAGES
Except as expressly provided by this warranty, EDS SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ASSOCIATED WITH THE USE OF THE PRODUCT OR A CLAIM UNDER THIS AGREEMENT, WHETHER THE CLAIM IS BASED ON CONTRACT, TORT OR OTHERWISE. The foregoing statements of warranty are exclusive and in lieu of all other remedies.Some states do not allow the exclusion or limitation of incidental or consequential damages, so this limitation or exclusion may not apply to you.

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8. PROCEDURE
In the event of a defect covered by this warranty, the purchaser should contact EDS - Via Cà Nova Zampieri 6, 37057 S. G. Lupatoto - Verona, Italy or an authorized EDS Service Center. To be honored, claims must be submitted within the 24 month warranty period (according to the product) and within eight (8) days of discovery of the defect. The determination whether the defect is covered by this warranty is within the sole discretion of EDS. EDS reserves the right to discontinue products and to change specifications for existing products at any time without notice and shall not be obligated to incorporate new features into products previously sold, even if those products are returned under a warranty claim. EDS may replace defective parts with similar parts of similar quality in the event that identical parts are unavailable. The purchaser must obtain advance authorization in writing before returning any product to EDS for warranty inspection. A return authorization number will be issued and must conspicuously appear on the outside of the product’s packaging. The issuance of an authorization number does not constitute acceptance of the claim, which will be evaluated by EDS upon its inspection of the product. The product should be cleaned and securely packed to prevent damage during shipment and must be accompanied by a letter specifying or including the following items of information:

a) dated receipt or other proof of date of retail purchase;
b) a copy of the warranty;
c) EDS part number;
d) detailed description of the problem experienced with the product, including a chronology of efforts made to correct the problem;
e) identification of the components used in conjunction with the product;
f) estimate of product usage: (i.e. accumulated mileage or time in service);
g) your name, address, and written authorization to ship the repaired product back to you freight collect (“C.O.D.”);
h) the product for repair must be shipped to EDS without any charge

9. APPLICABLE LAW
Any disputes arising out of this Agreement or the use of this product will be governed by the laws of
the country of Italy and will be decided by the Courts of Verona, Italy.

The technical information in this document have been carefully checked and can be considered reliable. In any case the EDS Company is not responsable for any eventual inaccuracy and reserves the right to make changes to any part of this document and/or to the products, in order to improve their quality, reliability or design.

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ELECTRONIC DETECTION SYSTEMS

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